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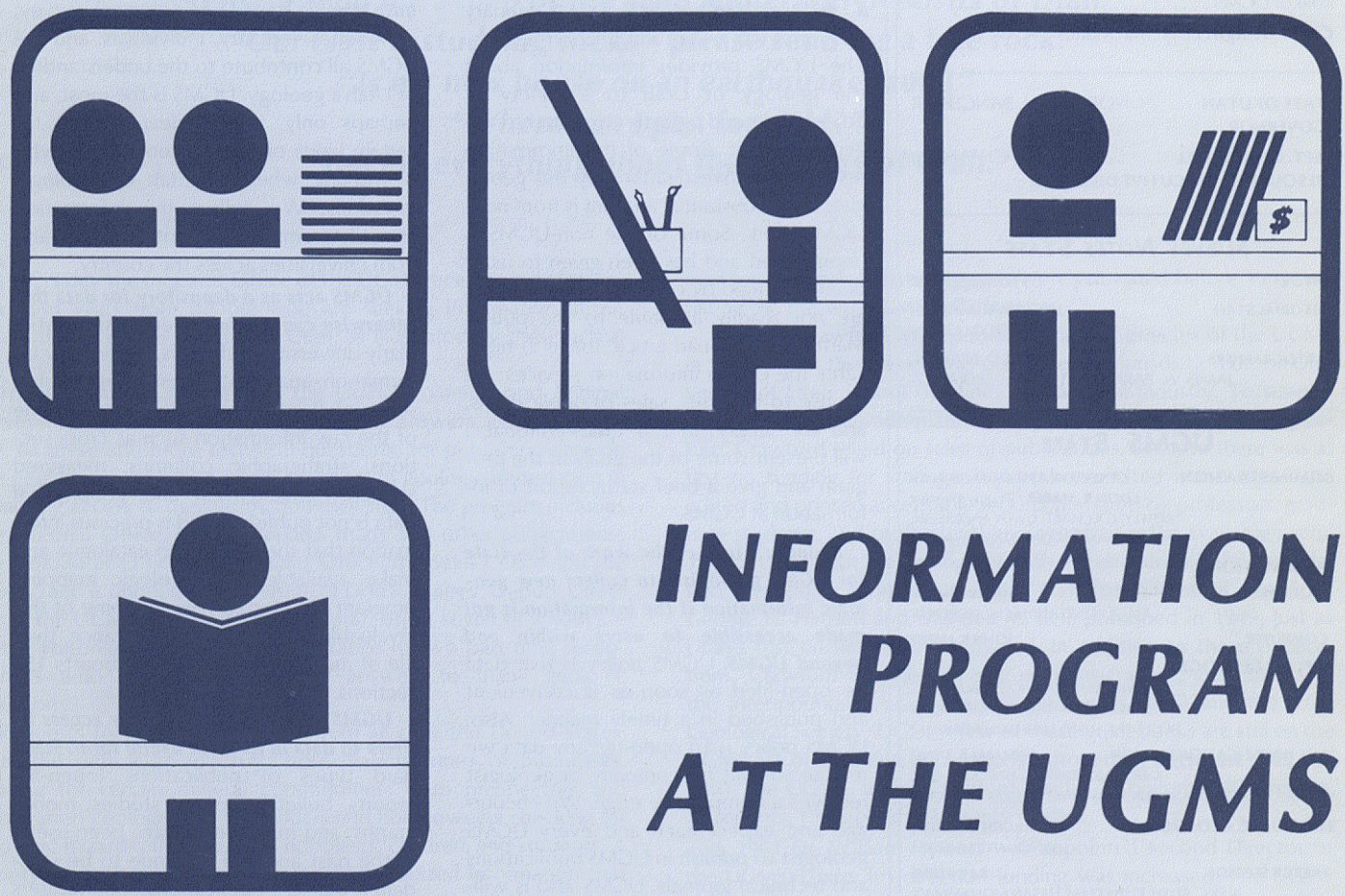

INFORMATION PROGRAM AT THE UGMS

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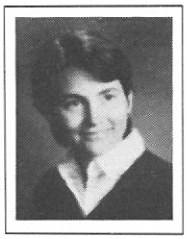
Cover Design: Leigh MacManus

Survey Notes is published quarterly by **Utah Geological and Mineral Survey**, 606 Black Hawk Way, Salt Lake City, Utah 84108 (801) 581-6831. The UGMS inventories the geologic resources of the state, identifies its geologic hazards, disseminates information concerning Utah's geology, and advises policymakers on geologic issues. The UGMS is a division of the Department of Natural Resources. Single copies of *Survey Notes* are distributed free of charge to residents within the United States and Canada. Reproduction is encouraged with recognition of source.



FROM THE DIRECTOR'S DESK

UGMS As An Information Agency

At their last meeting, the UGMS Board reaffirmed the UGMS' primary mission - we are an information agency. The UGMS provides information about the geology of Utah to a variety of government and industry users and to the general public. Some of the information results from investigations by our geologists but a substantial amount is from non-UGMS work. Some of the non-UGMS is unpublished and has been given to us or been identified by our staff in reports that are not readily available to the public. Martha Smith's lead article (page 2) highlights the UGMS information services: response to inquiries, sales of publications, and the library. In this quasi-editorial, I will present some of the goals of the program and give a brief status report of information at UGMS.

It doesn't further the work of the state for UGMS geologists to collect new geologic information if the information is not made accessible to users within and beyond UGMS. UGMS policy is that data be open-filed as soon as is convenient and published in a timely manner. Also, UGMS policy is to open-file any data we release so that no company or geologist receives a competitive edge. We encourage and expect each and every UGMS geologist to publish in UGMS publications and technical journals. UGMS also is willing to publish other geologists' work if the review process determines this furthers the understanding of Utah geology and is a wise investment of public funds.

A quantity of useful geologic information has been collected for government and public projects but is not easily available to the public so it's collected again, and sometimes again and again. The UGMS in its applied hazards and economic geology programs is collecting these hard to find reports. Much of this "gray literature", consists of unpublished technical reports such as engineering reports for construction projects, or company reports on mining prospects.

UGMS is part of a "team"; not an entity unto itself. The U.S. Geological Survey, universities, industry, individuals, and the UGMS all contribute to the understanding of Utah's geology. UGMS is the most, and perhaps only, logical clearinghouse for certain kinds of information such as who is working where in Utah on geologic questions. We collect this information annually from governmental entities and from universities across the country.

UGMS acts as a depository for data that otherwise can get lost. Geologists, particularly university professors, collect raw information, analyze it, digest it, and publish some of it with their conclusions. Some of the raw information such as cross sections, stratigraphic collumns, measured sections, geochemical and geophysical data is not published and is precious information that the UGMS can catalogue and make available. The geologic mapping program has started files for some of this invaluable information; for instance, their file of measured sections now boasts 150 sections.

UGMS wants to provide easy access by users to data in its most useful form. Standard types of publications (open-file reports, bulletins, special studies, monographs, and map series) have been useful in the past and will continue to be standard UGMS publications. Computers have impacted the handling of geologic information and we expect that in the future much UGMS information will be made available on computer tapes, discs and printouts.

UGMS information is available to the public. UGMS has some information collected by other entities and donated to the UGMS with the stipulation that it is confidential, but nearly all of our data is public information. Each major UGMS program (Economic Geology, Applied Geology, and Geologic Mapping) has its set of files. Even these files are public although we take precautions that these files and

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INFORMATION PROGRAM AT THE UGMS

by Martha Smith

"Please send me a map of the sand and gravel deposits of Utah."
"Our class is studying rocks - please send me a free rock."
"Is my new house on an earthquake fault?"
"Where can I pan for gold?"
"Tell me everything about the geology of Utah."

EACH day the Inquiries Office of the UGMS receives calls, letters, and visits from people who are seeking information about some aspect of the geology of Utah, as illustrated by these actual requests.

The Information Program of the Utah Geological and Mineral Survey (UGMS) is responsible for providing answers, as far as possible, to these and more technical questions; for publishing data on the geology of Utah and aiding the users of geologic information in obtaining access to the information they seek. The program includes the Editorial Office, which prepares maps and other publications; the Computer Office, the Inquiries Office, the Sales Office and the Library, and is under the supervision of Don R. Mabey, Deputy Director of the UGMS. The program has a staff of 11, seven of whom are in the Editorial Office, and the assistance of two part-time receptionists who are able to provide answers to many geologic questions.

Requests for information come from all over the United States, from the petroleum industry; from manufacturers or businesses, looking for certain mineral commodities; from prospectors and exploration geologists; from builders and homeowners checking for geologic hazards; from visitors, hobbiests, children, and students. A variety of government agencies need specialized information that the UGMS can provide. The variety of questions is endless.

Many of the questions are answered by the Information Specialist. If possible, the information seeker is provided with an appropriate UGMS publication which he or she can study in the Library or purchase from the Sales Office. If the information requested is not available in our library or on computer files, it may be found by consulting with a member of our staff who has the necessary expertise. If the information is not available at the UGMS, the visitor or caller is sent to the agency or person who can provide it.

History of Information Program

The purpose of the UGMS is to bring together and share as much information as possible about the geology, mineral resources and geologic hazards of Utah.

The UGMS was established by the State Legislature in 1931 and funded in 1948. Some early geological work was done by the Engineering Experiment Station (EES) of the University of Utah. A number of mineral-related reports were published before 1948, initiating the present UGMS Bulletin series.

Arthur L. Crawford was appointed the first director of the UGMS in 1948, when the Survey was put under the jurisdiction of the University of Utah School of Mines and Mineral Industry. To supplement the less-than-adequate funding provided by the State Legislature, Crawford relied on sales of publications. Because there was at first no funding for staff geologists, he solicited manuscripts and edited and printed acceptable reports prepared by professors, graduate students, and professional geologists, to make available useful information about the geology of Utah. He encouraged the compilation and publication of "Oil and Gas Possibilities of Utah" by George H. Hansen and Mendell M. Bell, published in 1949, just as Utah's first oil field was discovered. In addition to these publications, Crawford arranged to sell, on consignment, guidebooks of the Intermountain Association of Geologists (IAG) and the Utah Geological Society (UGS). A few of these guidebooks are still on the UGMS list of available publications. Altogether, between 1949 and 1961, the UGMS, under Crawford, issued 72 bulletins, 42 circulars, 87 reprints, 15 maps, and 4 county studies.

In 1961 Dr. William Hewett was appointed second Director of the UGMS. Under his direction funding was increased. The UGMS began increasing its geologic investigation program. A part-time draftsman was hired to prepare maps for publication. The Editorial Office included an editor (at first part time) and part-time student help to type the text for UGMS publications. A clerk was hired to take charge of publication sales and records. In the 13 years under his guidance, the UGMS published an additional 30 Bulletins, including 4 more county studies and a number of mining district studies, 3 coal monographs, 48 Special Studies, 19 Water Resources Bulletins; 13 Oil Field Studies, and 88 Reports of Investigation. In 1964 Hewett started the *Quarterly Review*, a quarterly newsletter (later renamed *Survey Notes*) to provide up-to-date news about the mineral industry, geologic hazards, and mapping program of Utah. During this period the IAG and UGS combined to become the Utah Geological Association (UGA) (see page 6 for a review of the latest UGA Guidebook 14, just published).

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In 1973 the UGMS was transferred from the University to the Utah State Department of Natural Resources. Don T. McMillian, who was appointed the new Director when Dr. Hewett retired, oversaw the moving of the UGMS to its new offices in Research Park in 1974. McMillan expanded the Information Program when he hired the first Information Specialist, Carlton Stowe, to manage the Sales Office and Library and to respond to requests for information from the public as well as collect information about the activity of the mineral industry in the state.

Under McMillan, in cooperation with the U.S. Bureau of Land Management and the U.S. Geological Survey, an inventory of the state's mineral resources was begun and put on computer. This was the first of a number of such computerized data files, including those for brine data on Great Salt Lake, oil and gas fields, coal analyses and coal-bed data. Much of the information in these files is available on request for the cost of retrieval.

In 1974, McMillan started *Utah Geology* to print collections of short papers prepared by the UGMS staff and other geologists. An *Energy Resouces of Utah* map, first published in 1975, became an immediate best seller as the energy crisis focused interest on the uranium, coal, oil, and gas resources in Utah. In 1981 a new geologic map of the state, prepared by Lehi Hintze of Brigham Young University, was published. In the seven years of McMillan's directorship, the UGMS issued 14 Bulletins, including two new county studies, 8 Special Studies, 7 Circulars, 20 maps, 80 Reports of Investigation, in addition to 10 issues of *Utah Geology*. The latter was discontinued in 1979 for lack of enough new material.

On July 1, 1981 McMillan retired and Genevieve Atwood became the fourth Director of the UGMS. Under her leadership the Information Program has been greatly expanded. The Editorial Office now supervises the old Illustrations Section, renamed the Cartographic Office. The Library and Sales Office are included in the Inquiries Section, and a new Computer Section has been added to handle the growing inventory of computer hardware and programs. To monitor the flow of publications and information, Atwood established a publications Review Board in 1982.

The Review Board

The chairman of the Review Board is the Editor, Jim Stringfellow; other members at this time include the Director, Genevieve Atwood; the Deputy Director, Don Mabey; the Senior Geologists, Hellmut Doelling and Archie Smith, and the Information Specialist, Martha Smith. Their goal is to improve the quality of UGMS publications by careful review of the original manuscripts and maps prepared by the UGMS staff and outside geologists (such as USGS staff, University professors, graduate students, industry geologists). The planning includes the determination of a need for a specific map or report, and the general interest in the subject.

Before a project is approved, the principal investigator prepares for the UGMS management team a proposal which delineates the type of research, the form of the finished product (map, bulletin, etc.) and the staff, equipment, time frame and costs required to complete it. The Review Board then approves, disapproves, or suggests alternatives, and determines review requirements such as who will review it, the need for outside review, and the time frame. When the completed report or map is reviewed and approved, it is sent to the Editorial Office. The Board sets priorities for publication and printing, the size of budget and staff required, and determines the agencies and officials who will be given a complimentary copy of the completed publication.

Editorial Office

The central core of the Information Program is the Editorial Office. This is the place where the magic is worked to transform field studies and research efforts into professional quality maps and booklets to meet the needs of the public. The Editor checks the material for style and clarity, then supervises the correction and typesetting of text, preparation of illustrations, proofreading, and final layout and pasteup of the publication, ready for printing. He prepares a list of specifications for printer's bids, and works with the printers to verify that all specs are met. He checks the printed product and, once approved, turns it over to the Sales Office for distribution and storage.

The Editorial Office has a staff of 3 cartographers at present, Kent Brown, Jim Parker, and Pat Speranza, and 2 graphic artist-typesetters, Carolyn Olsen and Leigh MacManus.

Sales Office

The Sales Clerk, Jackie Ledbetter, sets up an inventory file on the computer for each new publication. She then distributes copies according to the list prepared by the Review Board and mails out copies to these on her "standing order" list (libraries, businesses, other agencies, etc.). A predetermined number is sent to the Marriott Library at the University of Utah for its Gifts and Exchanges program. A year's supply of publications is stored at the UGMS Sales Office and the balance is sent to the warehouse for storage. When a customer asks for publications on a given subject, a computerized index is used to identify the appropriate material.

Most UGMS publications sales are by mail order (about 70 percent). Because the UGMS is located off the beaten path, there are relatively few walk-in customers. To assist those looking for geologic information, lists of available publications are updated every six months and sent out with orders and to all who request them. Press releases (prepared by the Information Specialist) including a summary of the contents are prepared for each new publication and sent to local papers, libraries, and technical journals, and are published in *Survey Notes*.

In addition to helping customers and keeping computerized records of sales, taxes, postage and inventory, the sales clerk is responsible for all UGMS mailing and bank deposists. At this time the Sales Office is undergoing some reorganization to make space for the Library, which is to be moved to the front of the UGMS building to make it easier for the public to find the information it is seeking.

Since we sell only our own publications, those of the Utah Geological Association, and a few by the USGS, we direct would-be buyers of USGS maps or books to the USGS Public Information Office in the Federal Building in downtown Salt Lake City.

Library

The UGMS Library is directed by Mage Yonetani. While still quite small, it has a select collection of books, maps, theses, and government documents relating to the geology of Utah, as well as reference material for the use of the UGMS staff. It also has a complete set of UGMS publications, including those that are out of print and no longer available from the Sales Office. There are at present about 3700 books on the shelves, 2500 government documents, 2000 USGS geologic maps and others maps, and nearly 300 UGMS Reports of Investigation and Open Files. There are files of USGS, U. S. Bureau of Land

Management and other federal documents, GSA Bulletins, *Economic Geology*, and other periodicals that maintain their value through time. A computerized shelf list is being prepared to simplify location of publications stored in the UGMS library.

The UGMS library was originally started by Dr. Hewitt with bound copies of UGMS publications to insure that a complete set would always be available. He added USGS publications as they became available, and included essential references. As the collection grew, it was housed in the director's office, the staff work room, and finally in the editorial office. It was not until the UGMS was moved from the University of Utah campus to Research Park that there was space dedicated to the library and a library technician hired to catalogue and keep track of the growing collection.

The library collection is growing as new titles are requested for use by staff, and by donations from friends of the UGMS. Such donations are very welcome and are, of course, useful as tax exemptions (hint!). In its new location the library will be (much more easily) accessible and it is the intention of the UGMS to add more material of general interest for travellers and hobbiests as well as more information for professional geologists, geological engineers and students.

The librarian has access to a number of UGMS computer files (the CRIB file of mineral resources of the state and the cumulative bibliography) and can assist visitors in finding special information contained in those files.

In addition to the regular library, the Mapping program has a special library for one-of-a-kind maps and selected air photography. While none of the library resources may be taken from the building, all are available for anyone to see or study at the UGMS.

Computer Section

The use of computers at the UGMS began less then ten years ago. Files include mineral resources of the state, coal data, oil and gas field data, Great Salt Lake brine data, earthquake data, and a number of specialized bibliographies for salt, coal, oil and gas, earthquakes, and geothermal resources, as well as the complete bibliography of the geology of Utah. The UGMS uses the Wang system, with several minicomputers.

In addition to data processing and word processing capabilities, the Computer Section has digitizing equipment and plotters for preparing maps and charts. There is a constant demand for new programs, some of which are prepared by the computer specialist, John Hand, and for newer, up-to-date equipment. A number of data files (CRIB mineral resources, by county, and the cumulative bibliography) have been printed and are available for actual cost of printing from the Sales Office. In the near future much of this material will be available on 5 1/4" floppy disks at a minimal cost. The UGMS Computer Section also works closely with the Automated Geographic Reference (AGR) system of the State Data Processing Center, to do special analyses involving geographic information on equipment not available at the UGMS.

Inquiries Office

The Information Specialist, Martha R. Smith, as a member of the Review Board is knowledgeable about UGMS publications and can help visitors locate those publications which answer their questions. The Information Specialist is also responsible for preparing announcements of new publications and in other ways publicizing the products of the UGMS. Together with the geologist-receptionists, she can answer many of the questions about the geology and mineral resources of Utah (and questions such as those listed at the beginning of this article). Some questions require some library research, or a search of UGMS files; this service is available for those who cannot, for some reason, do their own. Special computer searches and data printouts are available for a reasonable cost.

Some inquiries must be referred to other agencies. The UGMS has limited laboratory facilities and can do only limited mineral identifications, but sends people needing such information to the U.S. Bureau of Mines Research Center or a local assay office. Statistical data on the mineral economics of Utah may be available from the U.S. Bureau of Mines in Denver, or the Utah Energy Office; data for the petroleum industry is available from the Utah Division of Oil, Gas, and Mining. Ownership of mineral claims can be determined by the U.S. Bureau of Land Management.

Many letters come from school children who are "studying rocks" and want to collect a "free rock" from each state for a class project. Rock hounds and amateur geologists come from all over the country and are looking for clear instructions and relatively simple information about the geology of Utah, places to see and where to find rocks and fossils that they are permitted to collect. (Schools in the Salt Lake area request that geologists talk to classes on career possibilities, a service we would like to provide. UGMS geologists do give such talks on their own time.) Scout troops come in asking for identification of rocks they have collected, or information about earthquakes and faults.

Survey Notes

An important source of information about the geology of Utah is the UGMS quarterly newsletter, *Survey Notes*. It is designed to inform industry, the geologic profession, government officials, schools, and the pubic what is being done, by whom, and where in Utah. It has been published regularly since its inception in 1964 by Dr. Hewett. In the past few years it has been upgraded from an 8-page black and white collection of miscellaneous news items to a 16 or 20 page report with colorful covers to enhance its appeal. Each issue focuses on a single major topic about the activities of the UGMS, or some aspect of the geology of Utah in which the UGMS is involved, plus appropriate news items such as levels of Great Salt Lake, earthquake activity, etc.

The intent of the UGMS, under the direction of Genevieve Atwood, is to continue to provide more complete, more accurate information about all aspects of the geology of Utah in order to improve the safety of Utah's citizens, encourage Utah's economy, and increase our knowledge of the structure and resources of the state. ■

***From* METALS ECONOMICS GROUP NEWSLETTER...**

The *MineSearch Annual 1984-85* profiles U.S. properties in 21 states that saw exploration activity conducted during the last two years. Almost 90% of the currently activity projects are precious-metal prospects, mostly gold. Approximately 50% of the gold prospects are underground targets and 38% open-pit targets, with the remainder placers, dumps, or tailings projects.

The state with the greatest amount of activity surveyed in the *Annual* is Nevada, with 178 explorations and developments projects. Arizona is second with 101, followed by California (98), Colorado (75), Idaho (72), and Alaska (66).

UTAH EARTHQUAKE ACTIVITY

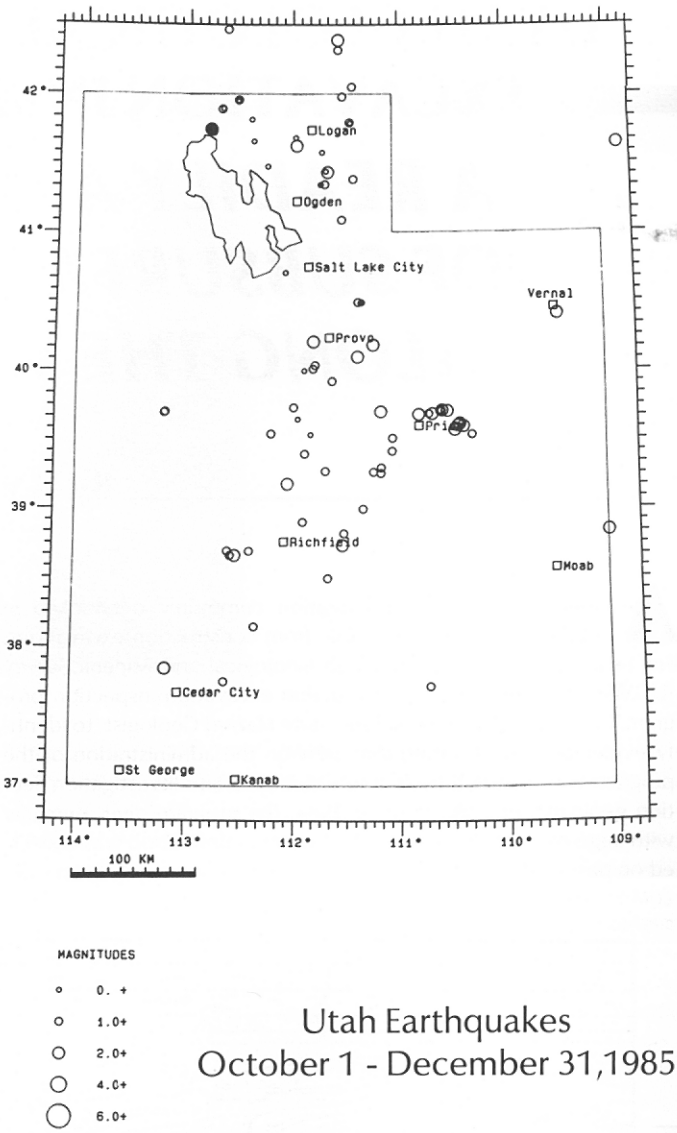
October through December 1985

By ETHAN D. BROWN

UNIVERSITY OF UTAH SEISMOGRAPH STATIONS
DEPARTMENT OF GEOLOGY AND GEOPHYSICS

THE University of Utah Seismograph Stations records an 80-station seismic network designed for local earthquake monitoring within Utah, southeast Idaho, and western Wyoming. During October 1 to December 31, 1985, 89 earthquakes were located within the Utah region. The epicenters shown in Figure 1 reflect typical earthquake activity scattered throughout Utah's main seismic region. The largest earthquake during this time period, M_L 3.0, occurred southeast of Vernal, Utah on October 7th, although there were no felt reports in that area. There was only one earthquake within the University of Utah regional seismic network that was reported as felt. This event, M_L 2.4 was felt in Ogden and Clearfield, Utah on Ocober 21 at 4:40 a.m. MST and was located about 20 miles northeast of Ogden. Clusters of seismic events ($M_L \leq 2.5$) in the vicinity of Price occur in areas of active underground coal mining. Clustering is typical for this area and has been observed in past reports.

Additional information on earthquakes within Utah is available from the University of Utah Seismograph Stations, Salt Lake City, Utah 84112 (telephone 801-581-6274). ■



Utah Earthquakes
October 1 - December 31,1985

NEW PUBLICATIONS

Reports of Investigation

Report of Investigation 203, *Geologic Evaluation of a Proposed Landfill Site in Weber County, Utah,* by Kimm M. Harty, 1985, 18 pages. Price $3.50 over-the-counter, $5.00 by mail, prepaid; please add $.22 for sales tax if purchased in Utah.

Report of Investigation 204, *Engineering Geology for Land Use Planning for Research Park, University of Utah, Salt Lake City, Utah,* by Rober H. Klauk, 1986, 27 pages. Price $4.50 over-the-counter, $6.00 by mail, prepaid; please add $.26 for sales tax if purchased in Utah.

Open File Reports

Open File Report 84, *Southern Pacific Railroad Breach Monitoring Program, Interim Reports No. I-V* and *Flow Measurements and Predictions, 1986,* by J. Wallace Gwynn and Paul A. Sturm. Price $4.50 over-the-counter, $6.00 by mail, prepaid; please add $.26 for sales tax if purchased in Utah.

Maps

Map 78, *Geologic Map of the Lucin Quadrangle, Box Elder County, Utah* by David M. Miller, 1985. Two sheets in full color, scale 1:24,000, accompanied by a 10-page booklet. Price $5.00 over-the-counter, $6.50 by mail, prepaid; if purchased in Utah, please add $.29 for sales tax.

UGA Publication

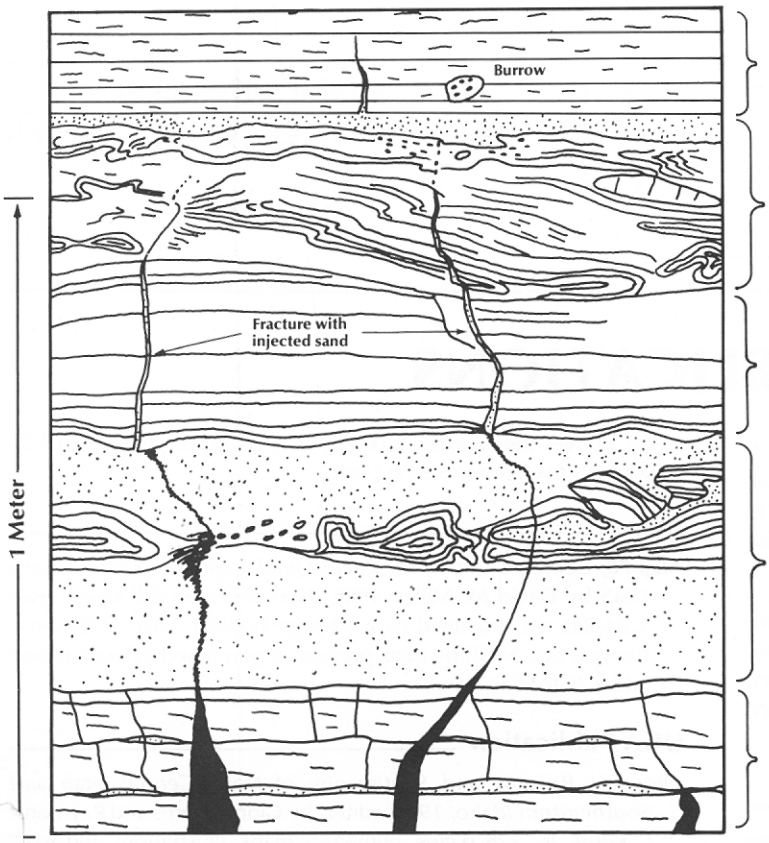
Orogenic Patterns and Stratigraphy of North-Central Utah and Southeastern Idaho, 1985, edited by Gloria J Kerns and Raymond L. Kerns, Jr., 328 pages, numerous maps, illustrations and road logs. Price $62.00 (includes postage). Please add $2.88 for sales tax if purchased in Utah. ■

UTAH GEOLOGICAL AND MINERAL SURVEY EXCAVATION INSPECTION PROGRAM

A READILY AVAILABLE SOURCE OF SUBSURFACE INFORMATION ALONG THE WASATCH FRONT

By Harold E. Gill

A source of geologic information commonly overlooked in urban areas is data available from construction excavations. For nearly two decades, the Utah Geological and Mineral Survey (UGMS) has maintained a construction excavation inspection program. Established by Bruce Kaliser, State Hazard Geologist, to identify evidence of past earthquake activity, the administration of the program was assumed by Harold Gill, UGMS Site Investigation Section geologist, in 1980. Prior to 1984, the program dealt primarily with large excavations in Salt Lake County. Information was collected on past ground displacement and liquefaction as well as on soils, bedrock, shallow ground water, and geologic hazards. In 1984, the UGMS entered into a cooperative program with the U.S. Geological Survey (USGS) to investigate earthquake hazards along the Wasatch Front. The earthquake hazard study permitted expansion of the UGMS excavation inspection program to other counties along the Wasatch Front. The data collected is used to document earthquake hazards for scientific study by the USGS and UGMS. However, the data is also available for access by geotechnical consultants; local contractors and architects; state, city, and county officials; other researchers; and private individuals.



Unit 1 Lean to fat clay (CL/CH); light brown, medium to high plasticity; interbedded lean and fat clay, no deformation, fractured, liquefied sand in fracture.

Unit 2 Interbedded poorly graded sand (SP) and silt (ML); light tan, nonplastic; highly deformed lenses of silt and sand, evidence for liquefaction.

Unit 3 Lean to fat clay (CL/CH); brown, medium to high plasticity; interbedded lean and fat clay, no deformation, fractured, liquefied sand in fracture, very fine sand lenses offset by fractures.

Unit 4 Interbedded poorly graded sand (SP) and silt (ML); light tan, nonplastic; highly deformed lenses of silt and sand, evidence that this horizon has liquefied and has been injected upward along fractures.

Unit 5 Fat clay (CH) with interbedded lenses of lean clay (CL); brown, highly plastic, minor lenses of lean clay offset by numerous fractures.

igure 1. Detailed log of excavation wall showing injection and deformed bedding.

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Figure 2. Large recumbant fold; one meter between hatch marks.

Since 1979, almost 100 excavations have been inspected, with one third of that number completed in 1984 and 1985. As a result of the program, a number of faults mapped as concealed or inferred have been verified, and areas in Salt Lake County with problem soils or shallow ground water have been identified. Documentation procedures for the excavations include recording geologic data on a standard form and taking photographs. When significant geologic features (deformed bedding, liquefaction features, faulting, etc.) are encountered, a complete photo log is made, and, if time permits, the feature is logged in detail. Figure 1 is an example of such a detailed log. A file is established at the UGMS for each excavation, and its location plotted on large-scale maps for easy location. These files can provide a useful source of inexpensive, detailed subsurface information to engineers, architects and others working on siting or construction of projects along the Wasatch Front. The results of the following two inspections illustrate the kinds of data being collected and how that information may be applied to the design and siting of various facilities.

An excavation inspection in January, 1982, for the University of Utah Rice Stadium enlargment revealed three faults within 1000 feet north-northwest of an inferred fault mapped by Richard Van Horn in 1969. The faults, observed on the west wall of the excavation, had a maximum displacement of 3.0 feet and were trending parallel to the mapped fault. Site stratigraphy displaced by the faults included a pre-Lake Bonneville alluvial-fan deposit (gravel with silt and sand, and a large number of subrounded cobbles and boulders) and an interbedded lens of lean clay with gravel. A fine-grained sand, apparently wind deposited, had filled open cracks along the faults. This inspection verified that faulting is present in this area and that fault investigations should be undertaken prior to siting new structures.

Further south in Salt Lake County, evidence has been found for a zone of deformed and liquefied material extending in an east-west direction across a portion of the south-central part of the valley. An excavation for a parking garage at 5600 South and 700 East exposed major deformation in bedded Lake Bonneville sediments. It is probable that two separate periods of deformation occurred at the site. At the south end of the excavation, deformed horizons of fine-grained sand and silt, interbedded with undeformed clay beds, indicate a minor disturbance probably occurring contemporaneously with deposition. In addition, extensive fractures along which liquefied fine-grained sand horizons have been injected are present. Figure 1 shows the sand injection and deformed bedding. This post-depositional event, possibly induced by earthquake ground shaking or a subaqueous landslide, likely also created the large recumbent fold (axial plane approximately 18 feet in length) found at the north end of the excavation (figure 2). Because the parking garage was a low occupancy non-critical facility, there was no need for additional investigation or a change in building design. However, future construction in the area may involve other types of facilities, for which a knowledge of possible disturbed soil conditions would be important during the planning and design phases of the project.

The UGMS Excavation Inspection Program is an ongoing project and will continue after the USGS/UGMS cooperative seismic study ends. Plans now call for placing the information in a computer file to make it even more accessible to the public. A paper describing the program and its possible uses in seismic hazard reduction will be published as part of the USGS Professional Paper on "Evaluation of Urban and Regional Earthquake Hazard and Risk in Utah". In addition, a Report of Investigation describing the program and its major findings is planned for the near future. In the meantime, the data are on file at UGMS and are available for anyone to study. Individuals requiring additional information should contact Harold E.Gill, Utah Geological and Mineral Survey Site Investigation Section.

REFERENCES

Scott, W. E., and Shroba, R. R., 1985, Surficial geologic map along the Wasatch fault zone in the Salt Lake Valley, Utah: U.S. Geological Survey Open-File Report 85-448, 18 p.

Van Horn, Richard, 1969, Preliminary geologic map of the southern half of the Fort Douglas Quadrangle, Salt Lake County, Utah: U.S. Geological Survey Open-File Report 69-308, Scale 1:24,000.

Continued from Page 2

our computer files are not misused or abused. As we gather more and more "gray literature" and hard to locate information, the usefulness of these files will greatly increase.

It takes time to develop information bases. High priority has been given to developing a statewide computerized catalog of locations of mineral occurences in the state. Present UGMS Economic Geology files include 1500 quadrangle files for all types of economic geologic resources and 202 quadrangle files for specific types of coal information. These files were begun eight years ago and are added to year after year. The Applied Geology program has undertaken a similarly ambitious program to catalogue information concerning geologic hazards. Special UGMS data bases include coal chemistry, Great Salt Lake brine chemistry, petroleum resources, age dates, sample library information, geothermal data, and, most recently, landslide occurrences.

UGMS has not and never will have all the publications about Utah geology. However, we hope to learn where these publications are located and let users know how they can locate them. The University of Utah's Marriott Library has most of the public literature, Federal government reports, and professional journals. UGMS has created a series of bibliographies about Utah's geology. In addition to the straightforward bibliography of publications about Utah geology, the UGMS in cooperation with the Bureau of Land Management had many publications read, coded by keyword and location, and computerized so that computer searchs can be made for references to Utah geology by location, commodity, hazard, and other key words. The computer program is currently only running on the UGMS computer. Information from the bibliography is presently sold only as hard copy but we hope to have the bibliography available to computer users before too long. We're publishing other bibliographies, too. A coal bibliography has been available for two years. In press is a UGMS published geothermal bibliography which includes document references and annotations and describes the key federal and state agencies and some industry geothermal projects that have been undertaken in Utah. An earthquake bibliography is well underway and may be UGMS' first attempt at a computerized, continually updated bibliography. Rather than publishing a five year supply of books, we will publish only enough to meet immediate demand and as time goes on, we will add to the bibliography and print out a current version as customers request.

PLEASE DONATE YOUR "HARD TO FIND" INFORMATION

UGMS is not a large facility. It's disconcerting to think of all the geologic information that can't be accomodated by our building. Therefore, rather than published information, we ask that you donate any raw information on the geology of Utah you might have. We especially want to add to our collection of old mine maps, old geologic maps, industry geologic information (geochemistry, geophysics, interpreted and uninterpreted geologic maps, cross sections, etc.), aerial photos, soils reports, measured sections, etc. UGMS can provide a special service by housing this information. It will be all the more valuable as geologists and companies contribute to it. Please help us so we can better serve you. ■

Genevieve Atwood

ROLE OF UGMS

—immediately after an earthquake—

In December 1985, the UGMS began work on the Earthquake Response Procedure Project to define the role of Utah Geological and Mineral Survey following a major earthquake in Utah. Two interns from the University of Utah, Steve Pierce, a Master of Public Administration (MPA) student and Mary Noonan, a law and MPA student, are working with Genevieve Atwood to identify what must be done and what could be done by various sections of the geologic community after a major earthquake. For instance, there will be a need to communicate information about the event, to document shortlived phenomena, to identify potential for aftershocks, to advise on associated hazards (landslides, rockfalls, etc.), to know who is doing which geologic investigations, and to identify public health and safety concerns. (Clearly some of these responsibilities are not the role of the UGMS. Some are.)

The project which is funded by a grant from the Federal Emergency Management Agency (FEMA) through the Utah Division of Comprehensive Emergency Management (CEM) follows a workshop held by US Geological Survey, FEMA, CEM and UGMS last summer. One of the goals of the workshop was to identify the role of UGMS in the event of an earthquake. The Response Procedure will clarify the UGMS role and an additional report will suggest revisions of the current Department of Natural Resources' earthquake response plan.

Input from the University of Utah Seismograph Stations, CEM, USGS, and other agencies will be used in formulating the response procedure. This effort will not only better define UGMS' post-earthquake responsibilities, it will also promote close working relationships among the critical actors. ■

GREAT SALT LAKE LEVEL

Date (1985-86)	Boat Harbor South Arm (in feet)	Saline North Arm (in feet)
Nov 1	4208.35	—
Nov 15	4208.45	4207.70
Dec 1	4208.60	—
Dec 15	4208.75	4207.95
Jan 1	4208.90	4208.15
Jan 15	4209.00	4208.25

Source: USGS provisional records.

IN MEMORIAM

Dr. Allen H. James

Dr. Allen James, well-known geologist and mining engineer, died on September 4, 1985 in Salt Lake City at the age of 74. He was born on January 17, 1911, in Hollywood, California. In 1932 he graduated from Stanford University, and he received his Ph.D. degree in economic geology from MIT. He worked as a mining engineer and exploration geologist in Argentina, Brazil, Mexico, Costa Rica, Cuba, and Puerto Rico for U.S. Smelting and Refining Company, St. Joseph Lead, and others. He worked for more than 25 years for Kennecott, and was supervising geologist for operating properties for 18 years.

Dr. James was a member of the AIME for more than 50 years as a member of the Geological Society of America and of the Utah Geological Association. He was the author of many articles on geology and mining, including UGMS Special Studies 44, *Lead and Zinc Resources of Utah*. The Utah Geological Society Guide Book 16, on the geology of the Bingham Mining District, was dedicated in his honor. Only a few days before his death Dr. James completed his "mining autobiography," which is being prepared for limited publication by his daughter-in-law, Louise James.

From BLM Utah News Digest, January 16, 1986

An 11-year project to try to produce oil from shale on federal lands in Uintah County ended with a consortium of oil companies relinquishing their leases for oil shale tracts known as Ua and Ub, effective December 31, 1985. The tracts were acquired by competitive bidding in 1974...when bids reached $75.6 million and $45 million, respectively. Principals in the White River Shale Project were Standard Oil Company of Ohio, Phillips Petroleum Company, and Sun Company. Their investment over the years amounted to $180 million...but recent estimates have been that start-up costs have risen to $2 billion rather than the $150 million original estimates. Under terms of the lease, the lessees will have to meet certain reclamation requirements. The investment resulted in no commercial oil shale production.

Federal ownership of the bed of Utah Lake was affirmed by the 10th Circuit Court of Appeals in a December 30, 1985 decision. The State of Utah had contended that the lake bed belonged to the state because the body of water was navigable. But Federal Judge Bruce Jenkins ruled that the land had been withdrawn in 1889 by John Wesley Powell...and provisions of the Submerged Lands Act do not apply. The appeals court upheld Judge Jenkins' decision.

UTAH NATURAL RESOURCES
Utah Geological and Mineral Survey
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Salt Lake City Utah 84108-1280

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